

# The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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## Taxation and the Future

THE problems raised by war are always very considerable, and not unnaturally admit of more than one viewpoint. Chancellors of the Exchequer are in the nature of things transient. They do their best to raise the necessary revenue, and having succeeded in balancing the national budget more or less, have done their duty and pass to other offices of State—or out of office. The business administrator, however, who has to pay a good deal of the taxes, remains at the head of his business, which must continue to prosper from generation to generation if the country as a whole is to prosper and to pay its way. Not unnaturally, therefore, the reaction of heads of businesses to the Acts of Government is not invariably favourable. This does not, even in war time, signify any disloyalty, but is an honest difference of opinion between two policies each designed to advance the public weal.

One of these differences of opinion relates to the Excess Profits Tax. The Chancellor, anxious, and justifiably anxious, to prevent any suspicion of profiteering, fixed this at 100 per cent., so that in effect no firm can make greater profits than it made during a given past period, irrespective of what has happened since then. Chairmen of important industrial concerns have referred to the difficulties that this will cause in their annual addresses to their shareholders. Mr. Benjamin Talbot, of the South Durham Iron and Steel Co., Ltd., maintained that since the whole of the activities of his company are directed to the assistance of the Government, his shareholders—who like the rest of the country must have a reasonable income—should be entitled to a reasonable return on their capital. Furthermore, he maintained that the company should be allowed to retain ample funds not only to give the normal depreciation provided over a period, but also sufficient to cover the overtaxing of the plant which is preventing essential repairs from being effected. In a recent issue of THE CHEMICAL AGE it was reported that Major-General Sir Neill Malcolm, of British Benzol and Coal Distillation, Ltd., looking to the post-war position, maintained that companies should now be building up reserves for the bad times which may or may not then occur. "That," he said, "can only be done by limiting the Excess Profits Tax to a more reasonable figure than 100 per cent." His suggestion, which seems a very reasonable one, was that the Excess Profits Tax should be, say, 80 per cent. and that the remaining 20 per cent. should be compulsorily lent to the Government, placed in reserve and made available after the war for necessary expenditure. We trust that more will be heard of this proposal. The Minister in charge of reconstruction might give it his attention.

Unquestionably the Government must have as much money as can be spared for essential war purposes. It is an essential war measure to ensure that all the population has an adequate income to avoid hardship and under-nourishment; and this applies to the middle classes as well as to the working classes, a fact which often escapes recognition. But we must look forward to the post-war years and, in the interests of everyone alike, must strive to avoid the difficulties that came upon us after the previous war. Two instances will suffice. It is fresh in memory how the cotton industry found itself the possessor of surplus plant for which no use could be found; the steel industry was not in much better case. Coming nearer to the chemical industry, it will be remembered how under Government control the coal-mining industry, having worked its coke ovens well nigh to death in 1914-18, and having found that its plants were then obsolete by reason of new developments abroad, was unable to modernise them until 1933 because there was no money available. This caused acute difficulties and handicapped our iron and steel industry in meeting foreign competition.

The chemical industry will be particularly interested in this problem because the pace of chemical discovery and development is apt to cause a higher rate of obsolescence there than in other industries. Moreover, the wear and tear on plant is often considerable, and the problem of replacements assumes a proportional importance. After the war, two things will be essential for this country. One is the possession of up-to-date industrial equipment that will enable the export markets to be retained, and fresh markets to be won. The other is the avoidance of unemployment as far as is humanly possible. If adequate reserves are put aside now, it will be possible to remodel and renovate existing plant, and to erect new plant for improved processes, thus effecting our first purpose. The manufacture and erection of this plant will keep the workers busy, and will facilitate the change from war to peace conditions. The difficulties of maintaining plant in a good state of repair are to-day very considerable. The first essential must be to maintain production, and this is often done by makeshift repairs such as the skill and intelligence of the staff can devise, but which cannot indefinitely fulfil the functions of new plant. Even if repairs can be effected, the difficulty of obtaining the necessary plant within a reasonable period is considerable, and must in the long run cause delays. There will be a lot of work to be done in this direction after the war, but without proper reserves it cannot be put in hand. This is an obvious post-war problem that must be faced NOW.

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## NOTES AND COMMENTS

### "Safety First" Renamed

THE National "Safety First" Association, many of whose notices have appeared in the columns of THE CHEMICAL AGE from time to time, has changed its title to the Royal Society for the Prevention of Accidents. The change, which, we think, will be widely approved, was made at an emergency meeting of the organisation at its London headquarters last week. It was stated that the new title not only describes accurately the work of the association, but also that the King, who has been patron of the association for 15 years, has given it his approval on the recommendation of the Home Secretary. The resolution changing the title was moved by Sir Herbert Blain, who founded the movement 25 years ago, and seconded by Mr. A. W. Garrett, Chief Inspector of Factories. The feeling that prompted the suggested change was explained by the general secretary of the association, Colonel J. A. A. Pickard, who said that the original meaning of the expression "safety first" had been distorted in a selfish sense which was entirely inappropriate to the prevailing conditions. The work of the association was never more necessary than to-day, and it was felt that it might be handicapped if it were carried on under a title which through wrongful interpretation was felt to be so contrary to the present needs and spirit of the country.

### Australian Potash

AUSTRALIA, through the agency of the Commonwealth Council for Scientific and Industrial Research, is making a thorough exploration of domestic potash resources, to make up for imports formerly received from Germany and, in lesser degree, from Sweden and Switzerland. In Western Australia governmental preparations are being made with a view to producing potash from alunite deposits in the bed of Lake Campion, 250 miles from Perth. It is estimated that 2,000,000 tons of this basic hydrated potassium alum are available at Lake Campion in deposits that could be removed readily by dredging. From this quantity some 250,000 tons of potassium sulphate could be produced, enough to meet present Australian requirements for 25 years. It is proposed to produce 200 tons a week, which would meet the Commonwealth demand. Australia normally imports about 125,000 tons of potash salts annually, and it is esti-

mated that two-thirds of the total is used for agricultural fertilisers in the form of potassium sulphate and potassium chloride. Australian firms handling potash, fearing a shortage such as occurred in the last war, are reported to have built up stocks that should last for twelve months. By the end of that period it is hoped that the Western Australian plant will be producing commercially. The production of other forms of potash from wool is being investigated. The sweat in wool is composed largely of potassium soaps, which can be obtained by steeping the wool before scouring. It is reckoned that sufficient potassium carbonate and caustic potash for Commonwealth requirements can be produced from this source. In the year ended June 30, 1939, Australia imported from Germany 10,709 cwt. of potassium carbonate and pearl ash and 7,091 cwt. of caustic potash.

### Shop-Window Publishing

BENN BROTHERS, LIMITED, the proprietors of THE CHEMICAL AGE, who have specialised for many years in the publication of trade journals in the language of the customer, have made another contribution to the British export drive with the appearance of the first issue of *Textil*. This new departure is a development of the ten-year-old *Industria Britannica*, a general export trade journal designed, by the use of the Spanish language throughout, for the buyers of British goods in the countries of South and Central America. It is, in fact, a shop-window for the textile industries of Great Britain, whose Export Councils send encouraging messages to the new periodical for its help in their increasingly successful campaign for a greater share of the trade of Latin America.

### Help them to Help the Red Cross

SINCE the Red Cross Penny-a-Week Fund was formed a year ago, with the co-operation of the British Employers' Confederation and the T.U.C., more than 28,000 employers in every branch of industry have afforded facilities for their employees to become regular contributors. As a result the Fund now has a total membership of four millions, and is contributing to the general funds of the Red Cross at the rate of £15,000 a week. Total contributions at the end of December exceeded £400,000. Good as this result is, however, it must be considerably improved upon during 1941 if the fund is to fulfil the task which it set out to accomplish a year ago. It was estimated then that at least £3,000,000 a year would be needed to finance the many-sided war work of the Red Cross, and it was hoped that, through the Penny-a-Week Fund, the workers of this country would contribute at least one-third of that sum. While, therefore, the total for the first year is considerably less than the yearly estimate, the present rate of collection holds the promise of a much better result in 1941. Nevertheless, much remains to be done before the total of £1,000,000 a year is achieved. Employers everywhere can help by bringing the Fund to the notice of their workpeople, and by providing facilities for them to become members. The collection machinery is simple. At the end of each working week the employer deducts, with the consent of the worker, one penny from each pay packet. The resulting accumulations are placed to the credit of the fund at intervals through a special bank account. Employers who wish to co-operate with their workpeople in helping the Red Cross in this way should write to the Secretary, Red Cross Penny-a-Week Fund, 89 Kingsway, London, W.C.2.

# MOTOR METHANE FROM COAL

## The Development of Gaseous Fuels

by "TAUX"

**I**NTERNAL combustion engines are being run on methane, but it is not from coal. It is from the bacteria beds of sewage works and contains 30 per cent. of  $\text{CO}_2$ , but nevertheless it is generating 3000 h.p. in the Midlands, and the same power in Middlesex, and again in Surrey power is being generated by this gas. In Italy the Fiat Company have constructed and put into operation some hundreds of special methane engines on railway and road duties. In Germany Motorenmethan, a liquefied mixed gas with a predominance of methane, has been in use for road transport for some years. In Russia liquefied methane from natural gas sources has also been put into the same service.

At the Surrey works 30 corporation lorries are being converted to run on methane; they are to be equipped with steel cylinders to carry gas compressed to 3000 lb. per sq. in. and a compression plant is being installed for this purpose. The same scheme has been initiated at a Middlesex sewage works.

Another source of methane is from coke-oven plants, in which case the gas must be separated from the hydrogen and the carbon monoxide also produced; fire-damp in collieries is a further source and there is a project to bring this gas to the surface with the idea of using it as a fuel.

The manufacture of town gas produces methane to the extent of from 25 to 35 per cent. Town gas is a very convenient fuel and is being used at the present time in continually increasing quantity for motor transport. It is used in two forms; at atmospheric pressure in roof bags on cars and lorries, and in steel bottles compressed to 3000 lb. per sq. in. The trouble in both these cases is the small mileage per charge of bag or cylinder. A gas bag will have the equivalent of just over half a gallon of petrol. The usual steel cylinder, 8 in. dia., 6 ft. 2 in. long, carries the equivalent of a gallon and a quarter of petrol. Some lorries have four or six cylinders each giving a mileage of 13 to 14 miles. It is practically impossible to carry these cylinders on a passenger car. The mileages on gas fuel will not compete with those on liquid fuels.

The complete gasification of coal under high pressure will provide an excess of methane over town gas requirements and by reason of its production under pressure, liquefied methane in very considerable quantities will be the resulting production. With this most important development an accomplished fact methane will have overcome the greatest objection to its prospect of becoming a permanent institution as alternative fuel to petrol.

### Physical Properties of Methane

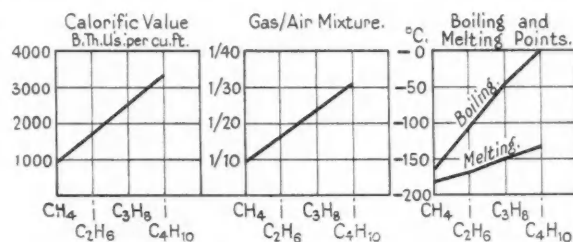
Methane— $\text{CH}_4$ —is a colourless, odourless gas at ordinary temperature and pressure. It liquefies at  $-165^\circ\text{C}$ . and solidifies at  $-186^\circ\text{C}$ . Its density is .559 (air = 1). Critical pressure is 55 atmospheres and temperature  $-82^\circ\text{C}$ . Its mixture with air is highly explosive; fire-damp in coal mines is this condition. The saturated hydrocarbons, the group of which methane is the first member, show such regularity of relationship in so many of their properties that we are enabled to estimate some of the possibilities of the utilisation of methane as a motor fuel from already ascertained facts in other related gaseous compounds in the same series. The tables in the next column set out some of the relationships.

Liquefied butane and propane have been in use for many years in America as fuels for stationary and transport vehicle engines and for industrial purposes. Particulars of engine tests made by the suppliers of these liquefied gas fuels—the Philgas Company of Detroit—give figures on these two gases which we can project back to methane with reasonable prospect of their attainment when suitable supplies of the gas are available. These figures are given below and they extend forward to petrol as a comparison:—

	B.H.P.	Compression Ratio.	Fuel Octane.
Ethane (Petrol)	64	4.4	61
Butane	86	6.75	93
Propane	99	6.95	125
Projected back to methane, the following figures are obtained:—			
Methane	116-120	18-20	175-200

Ethane has been very little used as a fuel by itself, although it occurs with the other gaseous hydrocarbons in natural gas. The Graf Zeppelin used it as fuel.

It is important that methane can be used as an alternative fuel in existing engines without any alteration whatsoever. The power generated would under such conditions be somewhat lower than when running on petrol, but since engines converted for town gas are running under the same conditions and quite satisfactorily, methane would be equally suitable.



Comparison of properties of methane, ethane, propane and butane

If the compression ratio is raised then much more power than with petrol is obtained and eventually an engine designed for methane would give very considerably more power as indicated in the foregoing table. The actual effect of this increase of power would be that an 8 h.p. petrol car could be operated just as well by a methane engine of 5 h.p. or even less.

The low temperature of liquefaction of methane,  $-165^\circ\text{C}$ ., would appear at first sight to be a difficulty in handling and transporting it to storage tanks. However, as we have seen that it is actually in use in Russia and Germany, the technique of handling must have been developed. Further, liquid oxygen, which has a liquefaction temperature  $20^\circ$  lower than that of methane, has been in daily use in industrial establishments for a number of years all over the world and no difficulty is experienced in dealing with it. The receptacles are in the form of thermos flasks to insulate the liquefied gas from the outside air.

When the time comes to turn what is merely an alternative fuel proposition into a permanency, all the advantages available must be made use of in order to obtain full results of its properties. As has been seen in the figures quoted, the horse-power available is much higher, which is due to the possibility of raising the compression ratio very considerably; and this in turn is possible because of the higher octane value or anti-knocking qualities of the gaseous fuel as compared with vaporised liquid fuel. The completeness of combustion of a gas as compared with a liquid, independent of the calorific value, is another valuable property, as the question of economy becomes involved with this quality, which, however, is not the indication of the power to be obtained from it.

For 120 years aspiration of the fuel along with the air charge has been the system of gas engine induction. It took the liquid fuel engine designers only some 20 years to find out that it was possible to put in a complete air charge to the cylinder without any displacement by the fuel volume, by injecting the fuel instead of aspirating it. This was the

beginning of the diesel engine, as this system permitted the use of heavy oil which would be impossible in aspiration systems. Incidentally the Germans have recently reverted to liquid fuel injection of petrol in preference to aspiration for aero engines, allowing them to use lower grades of petrol with satisfactory results, apart from other advantages.

The need for freeing the induced air charge from the volume of gas fuel which reduces the efficiency is much greater than in the case of liquid fuels, on account of the great difference in the density of the two classes of fuels. Petrol or oil fuel aspirated in the form of a vaporised liquid occupies only 2 or 3 per cent. of the total aspirated volume, whereas town gas occupies 20 per cent. and methane 10 per cent. Therefore, fuel injection would free this trespassing fuel volume to be replaced by air for combustion, the amount of which could be adjusted to the greater air volume now obtained, with consequent corresponding increase in power generated by the charge.

This possibility was envisaged by W. A. Erren some years ago when he conducted experiments in gas fuel injection, both in Germany and in London. The fuel was timed to the

individual cylinders of the engine by a hollow camshaft laid alongside the engine and driven by a chain. Ports in the wall of this hollow shaft in the required positions coincided with openings leading through the water-jacket to the combustion chamber above the piston. Several engines were converted, one of them being a Morris, and the results reported were most encouraging.

Other advantages accrue from the use of methane; for instance, neither the fuel nor its exhaust fumes are poisonous. Town gas is poisonous, as is also the exhaust gas of petrol.

A further prospective development made possible by the gaseous nature of methane is its utilisation as fuel under boilers for steam raising, thus encouraging the revival of the steam vehicle. Very little reflection is necessary to appreciate the possibility of the perfect control of methane used for such a purpose, to follow the fluctuations in power and speed required on an engine for road transport purposes. Its capacity for such control is greatly superior to that of either solid or liquid fuels. Such a development might well have a revolutionary effect on mechanical transport, as a steam engine is the most powerful flexible and reliable prime mover of all; it is the fuel that has been found wanting.

## Fumaric Acid Manufacture

### Catalysis with Thiocyanates

**P**HOTOCHEMICAL transformation of maleic acid to the isomeric fumaric acid can be effected, but the change is more conveniently carried out by heating either alone or in presence of a mineral acid. Some years ago it was observed by Terry and Eichelberger that the isomerisation could be catalysed by means of potassium thiocyanate (*J. Am. Chem. Soc.*, 1925, 47, 1402). They secured a 68 per cent. conversion by heating an 8 per cent. solution of maleic acid containing 0.5 per cent. potassium thiocyanate in a sealed tube for 8-2.5 hours at 99.2° C. With maleic acid now available at a very low price as a result of improvements in its production by vapour phase oxidation of benzene or naphthalene, the process of conversion to fumaric acid has attracted fresh attention in the last few years and the method of Terry and Eichelberger has been modified to give high yields on a commercial scale. The improved process (U.S.P. 2,208,519 of Spence and Mitchell, assigned to the Röhm and Haas Co.) involves the use of a much more concentrated aqueous solution of maleic acid and a higher percentage of potassium (or sodium, ammonium, etc.) thiocyanate. Its great advantage is that it can be operated at normal pressure. Fumaric acid of 95 per cent. purity (adequate for many purposes) was obtained in 85 to 90 per cent. yield by heating a 60 to 65 per cent. solution of maleic acid with 1 to 3 per cent. potassium thiocyanate at 100 to 120° C.

## Cellulose Phthalate

### Esters Stable at High Temperatures Obtained

**P**oor solubility and low heat-stability were among the unsatisfactory features of cellulose phthalates prepared by the methods of earlier workers. It has now been reported by Nikitin and Korcemkin (*J. App. Chem.*, U.S.S.R., 1940, 5, 743-750) that an all-round improvement in properties and more rapid esterification occurs when phthalic anhydride is reacted with wet soda cellulose in presence of pyridine as dehydrating agent. Under the conditions employed by these workers (an operating temperature of 105 to 110° C. and a reaction time of 4 to 5 hours), esters are obtained in which 1½ to 2 hydroxyl groups in each  $C_6H_4O_2$  unit are substituted by the phthalic radical. Still more rapid, it is reported, is the phthalation of cellulose hydrate formed by precipitation from a solution of cellulose in ammoniacal copper hydroxide. Phthalic esters prepared by the Russian chemists differ from esters prepared with the aid of phthalyl chloride in being stable at temperatures exceeding 100° C.

## Improved Phenol Process

### By-Products Eliminated

**P**HENOL, an essential war-industries chemical used in the manufacture of plastics and as a raw material in many other needs, is being produced by a new process in the plant recently opened in North Tonawanda, N.Y. by the Durez Plastics and Chemical Company. Other processes have produced phenol utilising from two or five pounds of other raw materials to one pound of phenol, but in the new process there are practically no by-products.

Benzene and hydrochloric acid with air are passed over a catalyst. Part of the mixture is converted into monochlorobenzene, which in turn is passed over a second catalyst with steam; the phenol is produced and the hydrochloric acid is freed to be used again at the starting point of the process. The heat used in the first step is used to produce the steam required in the second step.

## New Terpene Polymer

### A Rubber-like Resin

**A** NEW terpene polymer resin, called Nypene Resin, produced by the Neville Co., Pittsburg, Penna., U.S.A., is described in the *India-Rubber Journal*. It has a melting point of 140-150° C., pale colour, and is neutral and non-saponifiable. It has good resistance to water, acids, and alkalies. Its most interesting properties are its compatibility with paraffin, natural and mineral waxes, and its exceptional softening action on rubber. Although physically a resin, Nypene is stated to show a remarkable similarity to rubber. The hydrogen-carbon ratio is high, approximately the same as rubber. It is insoluble in acetone. It is compatible with rubber in all proportions and yields compounds of exceptional clarity. In spite of the high melting point of Nypene, it serves to soften and plasticise rubber. It is compatible with all forms of unvulcanised rubber, including latex, and with all grades of polybutenes in all proportions.

## SODIUM SULPHITE AND BISULPHITE

The danger of oxidation of sodium sulphite or bisulphite to sulphate or sulphate in course of manufacture (e.g., by reaction of sodium carbonate with sulphur dioxide) or during storage can be largely reduced, according to Silberman and Ivanov (*J. App. Chem.*, U.S.S.R., 1940, 4, 541-552), by the presence of a trace of an aromatic diamine such as *p*-phenylene diamine or dimethyl *p*-phenylene diamine. These antioxidants are effective when present to the extent of only one part per 200,000.

# NOTES FROM WORKS SAFETY JOTTINGS

## Precautionary Measures in Fighting Fires

by JOHN CREEVEY

**A** FIRE which breaks out in close proximity to chemicals is likely to give grave personal hazards, apart from spreading, unless certain precautionary measures are adopted in fighting it. Even apart from actual outbreak of fire, there are also precautionary measures which must be adopted in order to minimise the risk of a serious fire following some accident resulting in serious leakage from a stack of barrels or drums, or the escape of an inflammable vapour from some part of the plant.

\* \* \*

Liquids which are volatile and inflammable, and also miscible with water, such as acetone, and methyl and ethyl alcohol, should be sprayed with water to cause dilution, but with care against splashing or scattering any of the burning liquid or of floating it away so rapidly that it cannot be kept under control with the hose. In both cases the burning liquid may float on water for a short time, irrespective of the fact that the liquid is miscible with water. For attacking the fire generally there are the alternatives of extinguishers of the carbon tetrachloride or methyl bromide type, or of the use of large volumes of carbon dioxide to give a smothering atmosphere. In the case of an inflammable liquid which is not miscible with water, such as benzene and carbon disulphide, water must be used only for the purpose of cooling any tanks or drums containing the liquid; the burning liquid should be kept under control against spreading by liberal use of sand or earth, and the fire itself attacked by use of foam, carbon dioxide, carbon tetrachloride or methyl bromide. Both benzene and carbon disulphide give accumulations of heavy vapour, which gives need of thorough ventilation and of the rescue at shoulder height for any victim overcome by the vapour. The remarks given for benzene and carbon disulphide apply equally to ether, but it must be remembered that ether is by far the most hazardous of the three liquids (its boiling point is 35° C. against 46.5° C. for carbon disulphide) and that ether vapour will travel a very long distance to some point where it may be ignited by naked flame or the sparking of electrical apparatus. On the other hand, carbon disulphide vapour has that peculiarity of being liable to explode or ignite by shock, as by the fall and sudden fracture of a container.

\* \* \*

Of solids stored in drums, carbide is perhaps most dangerous because of the risk of generating acetylene. If water is likely to be used for a fire in a building where carbide drums are in store, the drums must be at once removed to a dry and safe place, and the place selected must be well out of reach of water from the hose pipes. Use dry sand to extinguish fire where drums cannot be removed. If water finds its way into a drum it will cause a violent explosion. Cylinders of acetylene gas must be kept cool by copious application of water and removed as soon as convenient. Another dangerous material in dry condition is aluminium powder; here an outbreak of fire must be smothered with dry sand—water, carbon tetrachloride, methyl bromide, soda-acid extinguishing means, or foam, are all hazardous to use. The spontaneous ignition of aluminium powder is often due to damp conditions of storage. What has been said of aluminium powder applies equally to zinc dust.

\* \* \*

When water is used to flood large quantities of ammonium nitrate adjacent to a fire, care must be taken to prevent the saturated water from washing down upon any combustible material such as stacks of sacking or wood shavings used as packing material, because fresh fires are easily caused as the salt dries out. Likewise care must be taken to prevent material from a broken case falling within reach of other

material which is burning or glowing, as explosions are easily possible. In flooding with water, high pressure jets must not be used. The same remarks apply to barium nitrate, sodium nitrate, potassium nitrate, sodium chlorate, potassium chlorate, and potassium permanganate. Where small quantities are involved in a fire, the use of carbon tetrachloride or methyl bromide is permissible. Particular care must be taken where articles of clothing or other textiles have become soaked with a solution of these salts in the course of fire fighting, for spontaneous ignition may be expected if they are not thoroughly washed by rinsing and wringing before drying.

\* \* \*

The liberation of ammonia gas from contact of ammonium salts with alkalis under conditions of the collapse of flooring above the seat of a fire, or by washing together under action of the fire hoses, can become decidedly dangerous as a personal hazard to those in attendance at the fire. Should it be necessary to enter part of the building where the ammonia fumes predominate, the use of a fine spray of water and quantities of damp sawdust will do much to reduce the intensity of the fumes, and this is often advisable even where a suitable respirator is available for use. It is also well to remember that accumulations of ammonia gas give danger of explosion in the presence of a naked light, and likewise with flame. Chlorine gas may be evolved where sacks or wooden kegs of bleaching powder become damp with water from a hose, but the trouble is passed over by spraying copiously with the water and allowing adequate ventilation to remove the chlorine already evolved. Bleaching powder, it may be well to add, is in itself non-inflammable, but in contact with certain organic materials it is likely to start a fire by friction, as when a sack is dragged along the floor of a storage building. A leaking cylinder of chlorine gas is best immersed in a tank of water, when the valve cannot be shut down.

\* \* \*

Naphthalene fires are best controlled with sand or earth, assisted by carbon tetrachloride, methyl bromide, carbon dioxide, or foam. The material burns with an intense smoky flame which greatly hinders the work of those engaged in fighting the fire. Inflammable vapours are evolved at its melting point, for which due precautions should be taken.

\* \* \*

For fats, waxes, and resinous materials involved in a fire, it is best to make use of the extinguishing properties of foam, carbon tetrachloride, methyl bromide, or carbon dioxide. To stop the flow of burning fats, make liberal use of sand or better still, earth; use of water will result in a scattering of the burning fat with explosive violence. The burning of fats, waxes, or resinous materials in the vessel in which they are being heated can be dealt with by covering the vessel with a sheet of metal aided by wet sacking to exclude the air. Sand or earth will provide the best means for extinguishing a fire in which varnishes or cellulose lacquers are involved, though the relative danger of the extent to which such a fire may get out of control will depend upon the nature of the solvent which is present; carbon dioxide is preferably used as a smothering agent for the solvent vapour which may still rise after use of sand or earth.

\* \* \*

Where carbon tetrachloride or methyl bromide are used as extinguishing agents, considerable care must be exercised in confined spaces, as both vapours are toxic if inhaled in moderately high concentration. For this reason breathing apparatus should be worn if it is available, as it should be.

## New Control Orders

### Laboratory Ware and Chemicals

THE Treasury has issued the Safeguarding of Industries (Exemption) No. 16 Order, 1940, dated December 27, 1940, whereby the exemption from the duty imposed by Section 1 of the Safeguarding of Industries Act, 1921, is prolonged, for certain classes of goods, from December 31, 1940, to June 30, 1941.

The schedule of goods covered includes long lists of articles which have previously been exempted from the duty by the following Safeguarding of Industries (Exemption) Orders: Nos. 4, 5, and 7, of 1939 and Nos. 2, 8, 9, 10, 11, 12, 13, 14 and 15 of 1940. The following classes of goods are covered by the schedule: optical glass and optical elements; scientific glassware; lamp-blown ware; laboratory porcelain; scientific instruments; X-ray tubes; arc-lamp carbons; rare earth oxides; sodium molybdate and sodium vanadate; synthetic organic chemicals analytical reagents, other fine chemicals and chemicals manufactured by fermentation processes; and vanadium-silica compounds for use as catalysts in sulphuric acid manufacture.

Copies of the Order (S.R. & O. 1940, No. 2182) may be obtained from H.M. Stationery Office, price 3d.

### Machinery, Plant and Appliances

The Board of Trade draws the attention of manufacturers of machinery, plant and appliances and those wishing to acquire them, to an amendment in the Statutory Rules and Orders governing the sale or transfer of machinery and to extension of the Orders to include additional machinery, plant and certain appliances. The new Order, the Machinery, Plant and Appliances (Control) Order, 1940 (S.R. & O. 1940, No. 2179) came into force on January 1. It amends the Machinery and Plant (Control) Order, 1940 (S.R. & O. 1940, No. 875) and Machinery and Plant (Control) (No. 2) Order, 1940 (S.R. & O. 1940, No. 1363). Copies of the Orders, price 1d. each, are obtainable from the Stationery Office.

Persons wishing to acquire, and manufacturers of, machinery, plant and appliances and parts thereof should take steps to acquaint themselves with the requirements of the Orders. Explanatory notices appeared in the *Board of Trade Journal* on August 1, 1940, and January 2, 1941. Any person wishing to acquire such machinery, etc., must obtain a supply licence, and manufacturers should not book orders until they know that the person to be supplied has obtained the necessary licence.

Application forms for licences should be obtained from the Industrial Supplies Department, Machinery Licences Division, Board of Trade, 25 Southampton Buildings, London, W.C.2.

### Invert Sugar and Glucose Prices

By the Invert Sugar (Maximum Wholesale Prices) (No. 2) Order, 1940, the Minister of Food has fixed maximum prices as follows: Invert No. 1 Sugar, 49s. 6d. per cwt., in 1-cwt. to 4-cwt. casks; Invert No. 2 Sugar, 48s. 6d. per cwt., in 1-cwt. pails; Invert No. 3 Sugar (including black), 47s. 6d. per cwt., in 1-cwt. paper sacks.

No invert sugar shall be sold wholesale unless packed in a container of a kind and capacity specified in the above schedule.

By the Liquid Glucose (Maximum Wholesale Prices) Order, 1940, the Minister of Food has fixed maximum prices for liquid glucose as follows:—

	s.	d.
In tanks containing 2 tons or more net weight	45	0
In barrels containing 3 cwt. or more net weight	46	10½
In drums containing 5 to 6 cwt. net weight	46	3
In drums or pails containing 1 cwt. net weight	46	7½
In tins containing 56 lb. net weight	48	3
In tins containing 28 lb. net weight	49	6
In tins or jars containing 14 lb. or less net weight	50	9

Where the glucose, contained in drums, barrels, or pails, is at buyer's request delivered in quantity less than 25 cwt. the seller may make an additional charge not exceeding 9d. per

cwt. On a sale of liquid glucose of a density exceeding 43° Bé, the seller may make an additional charge of 1s. per cwt. for each degree Bé. in excess of such density. On a sale of liquid glucose of a density less than 43° Bé, the maximum price shall be reduced by 10½d. per cwt. for each degree Bé. less than such density.

Both these orders (S.R. and O. 2197, 2198) came into force on January 1.

### Starch and Dextrine

The Minister of Food has issued the Starch and Dextrine (Control) Order, 1940, which came into force on January 6. By this Order, except in accordance with the terms of a permit or other authority granted on behalf of the Minister, no person shall sell or buy wholesale, or offer to sell or buy wholesale, any starch or dextrine.

The foregoing restriction does not apply to: (a) sale of roots of tapioca, cassava, manioc or mandioca, except where the same are supplied for use in the manufacture of textiles, paper, adhesives or other similar products; or (b) sale of any starch or dextrine which is destined for sale by retail.

Traders importing, manufacturing, processing, selling by wholesale or buying by wholesale any starch or dextrine shall furnish such returns relating to their dealings in starch or dextrine as may from time to time be required by the Minister of Food.

### Sugars Made "Not Chargeable"

Sugars have been added to the "not chargeable" column of Class 19(2) of Customs Notice No. 78, and the following substances have been removed from Class 19(1)(a) and will not be liable to Purchase Tax unless put up as medicinal preparations, e.g., as injections: dextrose; glucose, liquid; lactose; maltose; sucrose.

Vitamins and vitamin concentrates have been added to the list of substances under Class 19(1)(a) and are accordingly not chargeable unless put up for medical or veterinary use.

## Alleged Trading with the Enemy

### Trial of Chemical Company Directors

AT the Central Criminal Court on Wednesday was begun the trial of three company directors, Doreen Grant Gibbons, Louis Francis Szilagyi, and Thomas Ogle, all on bail, who are accused of having financial and commercial dealings for the benefit of the enemy. They all pleaded "Not Guilty." A plea of "Not Guilty" was also entered in respect of a similar charge brought against Metal and Electro-Chemical Products, Ltd., of London.

Main points in the speech of the Solicitor-General, Sir William Jowitt, who opened for the Crown, were that the company traded with a German-controlled Swedish Company, A/B Tudor, to whom they sent a consignment of antimony which they possessed in Belgium before that country was invaded, knowing that the metal would be made available to Germany.

In Germany there was a large concern called A.F.A. Berlin which made and sold accumulators, and Electro-Chemical Products, Ltd., was a subsidiary of that company. Its share capital was £200,500, of which Miss Gibbons held 250 shares and the other two directors 125 shares each. The remaining shares were held by I.loyds Bank Nominees, Ltd., nominees of A.F.A. London. In the spring of 1939 A.F.A. Berlin took steps to prevent their assets being seized in this country. They sold to another Swedish company, A/B Nordring, all their shares in A.F.A. London. The whole thing, said counsel, was a device to make it look as if the English companies were no longer controlled by the Germans. The hearing was adjourned.

Information Bulletin No. 177, issued by GEORGE KENT, LTD., Luton, gives details of interesting recent orders they have received for meters and automatic control equipment in connection with water, air, gas, steam and oil supplies.

## Paint Specifications War-Time British Standards

MANY materials normally used in the paint industry have to be imported and the Government has found it necessary to prohibit or restrict their use in order to relieve demands on shipping and to conserve currency. This has necessitated a complete review of the series of British Standards for paint materials. Where necessary the existing requirements of these specifications have been relaxed so as to allow the use of material of lower standard quality, and in addition, the use of alternative materials has been provided for.

The use of alternative materials provided in some measure a means of overcoming present and anticipated difficulties, and the specifications now include certain materials not hitherto covered particularly for materials for use as extenders. The alternative materials are for the most part home products. In cases where materials are no longer available, substitute materials are suggested.

The modifications and additional specifications are to be regarded as separate war-time specifications, and in no way affect the existing specifications which are retained to provide a standard for materials for export. In this field the level of quality demanded by existing British Standards now recognised throughout the world must be maintained in order to uphold the prestige of British exports. The War Emergency Specifications should always be used for materials for home consumption, and it is hoped that, having regard to the circumstances that have necessitated their preparation, any inconvenience occasioned by the change should be readily accepted as a national duty, since such inconveniences as may occur can be in no way serious.

Three separate documents have been issued as War Emergency Specifications for the paint industry.

### Oil for Paints

The new specification for oil for paints (B.S. 925,926) is interesting from two outstanding aspects. One is that it allows 25 per cent. of other drying oils to be admixed with the linseed oil, and thus increases the quantity of oil available for use in paints. The other is that it is a "heat-treated" product and as such is much more viscous than raw or refined oils. The increased viscosity results in an appreciable reduction in the quantity of oil required for a paint, representing an important economy in the use of material. It is stipulated that the additional drying oils must have an iodine value of more than 120. A wide-range of oils is available for use and it will therefore be incumbent on manufacturers to keep a close watch on the quality and characteristics of any oils they employ.

### Additional Extenders

Numerous materials are available in this country which are suitable for use as paint extenders. Complete specifications have been included for barytes (Type B), precipitated barium carbonate, china clay, kieselguhr, strontium sulphate, whiting (Paris white), and witherite. In addition to these there are a number of others which might be used, such as talc, french chalk, mica, slate powder, coloured earths, sands and other siliceous materials generally, and these are covered by a single specification entitled "Miscellaneous Extenders." An introductory note to this specification emphasises that when use is made of any of these materials it is essential that care should be taken to ensure that they are satisfactory for use in paint and that they will not result in incompatibility, e.g., fading.

### Alternatives for Chromes

There are several materials which can be used as alternatives to chromes, for example the yellow chromes may be replaced by yellow oxides of iron, red and organic oxides of lead produced from yellow basic dyestuff, sulphides and selenides of cadmium; while the green chrome pigments may not only be replaced by green organic pigments, but by mixtures of any of the foregoing yellow pigments with blue pig-

ments. These are covered by B.S. 927 and 928. Separate specifications are given for the alternatives for yellow chromes and for green chromes. Details of the properties of the alternatives as compared with the chrome pigments themselves is also given and this should prove a very valuable guide.

### Ready Mixed Paints

The new specifications for paints (B.S. 929) have some interesting features. Provision has been made for a standard priming paint (white lead base) and for two undercoating paints (white lead base and lithopone base) in six standard colours. There is a wide range of finishing coat paints (white lead zinc oxide or lithopone base) and the finish is oil gloss.

Copies of these specifications may be obtained from the offices of the British Standards Institution, prices:—Nos. 925 and 926 (together), 2s. or 2s. 3d. post free; Nos. 927 and 928 (together), 2s. or 2s. 3d. post free; No. 929, 2s. or 2s. 3d. post free.

## Sulphuric Acid Handling

### Developments in the Technique of Concentration

FOR some time past THE CHEMICAL AGE has been privileged to print every year, in its "Annual Review Number," an account of the current development of the Heavy Chemical Industries by Mr. P. Parrish. Not the least important among these industries is the production and use of sulphuric acid, and it may well be doubted whether anyone in the chemical industry is a greater authority than Mr. Parrish. Last Tuesday the Institution of Chemical Engineers had the benefit of hearing a paper from Mr. Parrish on "Modern Developments in the Design of Plant for the Concentration of Sulphuric Acid," and in it he gave a most interesting and comprehensive account of those developments, their advantages and their difficulties. This is not the place to print extracts selected from such a paper; in fact, every "heavy chemist" and chemical engineer should take the first opportunity of studying the paper in full and in detail, especially if he was unable to be present at its reading; above all he should examine the clear and comprehensive series of diagrams published along with it. This, however, being an issue in which special attention is devoted to works safety, we take the liberty of printing a few sentences on that aspect of the question—an aspect which Mr. Parrish insisted upon more than once.

"The handling of hot sulphuric acid is always attended with some risk, and it is important that extreme care should be given to all details of the plant. A skilled chemical engineer should supervise the construction to the last detail. The bracing of the setting, the drying of the brickwork and the starting of the plant all call for careful thought.

"The idea of working with large bulks of boiling sulphuric acid is never welcomed, either by the management or by plant operatives. If a cast iron vessel develops a fracture it is impossible to remove the boiling acid rapidly, and however quickly the fire may be withdrawn, or the combustion of oil or producer gas discontinued, the sensible heat of the brickwork is such as to volatilise the leaking acid, and cause all the inconveniences associated with a 'white chimney.'

"A serious fracture of a cast iron vessel would render operation of other adjacent units extremely difficult, and it is a question whether connections should not be provided to a serpentine cooling system, in turn connected with a large scrubber and powerful fan, in order to provide facilities for allaying the inconveniences likely to result from the worst contingency."

Modern developments, as described by Mr. Parrish, have incorporated features designed at least to minimise some of these evils, and it cannot be doubted, as he says, that inventive genius will be urged, along the lines he suggests, towards the ultimate discovery of an ideal concentrator.

## Personal Notes

MR. W. A. AKERS and MR. W. F. LUTYENS were appointed last week to be additional directors of Imperial Chemical Industries, Ltd.

MR. JOHN MACROBERT has been appointed chairman of William Fulton and Sons, Ltd., dyers and finishers, Glenfield Works, Paisley.

LIEUT.-COLONEL LORD DUDLEY GORDON, D.S.O., President of the Federation of British Industries, was at a recent meeting of the Grand Council, nominated for a second year of office.

MR. GEORGE E. PEARSON has retired from the positions of governing director and chairman of the Wellcome Foundation, Ltd., after 45 years' association with Burroughs Wellcome and Co.

MR. G. STEVENSON TAYLOR has been appointed by the Minister of Labour and National Service to take charge of a new branch of the Ministry, to be known as the Engineering Branch. He will advise on engineering matters, especially in connection with the organisation of munitions labour supply.

SIR CECIL BUDD has accepted the invitation of the Board of the Imperial Smelting Corporation to fill the vacancy arising from the appointment of Capt. Lyttelton as President of the Board of Trade. Sir Cecil has also been elected to fill the vacancy on the Board of the Zinc Corporation caused by Capt. Lyttelton's resignation.

PROFESSOR A. F. JOFFE, the distinguished Russian scientist, has been awarded the Order of Lenin, on the occasion of his sixtieth birthday, for his outstanding work in physics. Professor Joffe was responsible for the formation of the Physico-Technical Institute in Leningrad in 1918; he is a member of the Academy of Sciences of the U.S.S.R. and of many scientific academies of other countries.

## OBITUARY

MR. ROBERT ADAMS, A.R.C.S., late Senior Examiner, H.M. Patent Office, died at Barry, Glamorgan, on January 10, aged 71.

MR. DOUGLAS FREDERICK CLARKE, formerly for nearly 40 years proprietor of Clarke's Chemical Works, has died at Oswaldtwistle, Lancs, aged 69.

MR. JOHN WHITE HAMPSHIRE, director and general manager of Keith Blackman, Ltd., Tottenham, died on January 8, aged 71. Mr. Hampshire joined the company in 1892, became secretary in 1905, was elected director in 1921 and appointed general manager in 1925.

MR. DAVID BROWN DOTT, one of the oldest pharmacists in the United Kingdom, who was associated for many years with the firm of J. F. Macfarlan and Co., manufacturing chemists, Edinburgh, has died at Musselburgh, aged 88. His special knowledge of morphia and kindred drugs had won him world-wide recognition.

## Wool Waste Process

### Belgian Textile Expert Vindicated

A BELGIAN citizen, Joseph Bailly, living at Slaithwaite, was found not guilty at the West Riding Quarter Sessions at Leeds last week of stealing wool, and of offering to dispose of it in contravention of the Control of Wool Order. It was alleged that Bailly extracted wool from quantities sent to him to be processed, and resold it to a Bradford merchant. The defence contended that what was sold was reprocessed waste, but that a secret process made this of a quality that resembled Australian lamb's wool. A wool expert, Mr. H. Tetley, who, with a Bradford textile consultant, went to the mill to make a surprise test of the process, said they were given a free hand by Mr. Bailly. They were both astonished at the result of the test. After the waste had been processed the results were indistinguishable from Australian wool.

## The Flexibility of Waxes

### Improvements with Methacrylic Resins

BY blending wax-like materials with a proportion of a methacrylate resin the physical properties of the former are found to undergo a remarkable improvement, the resulting compositions being suitable for many applications previously barred to paraffin wax and other waxes. The new compositions are thus suitable as adhesives and flexible coating materials for textiles, paper, and building materials. A convenient method of forming the blends, as described in B.P. 520,399 of Du Pont de Nemours, is by stirring the wax with the polymerised methacrylic derivative at a high temperature, generally not less than 200°C. Examples given in the specification include 60 parts paraffin wax and a copolymer resin from 32 parts butyl methacrylate and 8 parts ethyl methacrylate (blending temperature 225°C.); 60 parts paraffin wax and 40 parts of the laurylimide of polymerised acrylic acid (at 200°C.); 60 parts lanolin and 40 parts polybutyl methacrylate (at 260°C.); 60 parts beeswax and 40 parts polybutyl methacrylate (at 240°C.).

Continuous sheets of these wax compositions may be cast from the hot melt and are useful for wrapping bread and other foodstuffs. Similarly cheese, fruit, or vegetables may be dipped in the melted mass, thus acquiring a protective coating that can be readily stripped before use. Another proposed application to the food trade is in the interior coating of beer and food cans, for which purpose an emulsion or solution may be used. The emulsion form is convenient also in the impregnation of cardboard containers and the moisture-proofing of paper bags. The emulsion itself can be economically prepared by emulsifying the wax in the liquid monomeric methacrylate before the polymerisation of the latter by the usual process of heat treatment in presence of a catalyst.

## Lac-Cellulose Lacquers

### Quick Drying Properties Obtained

COMBINATION lacquers containing different types of lac and ester and alcohol-soluble cellulose nitrate have been formulated and their properties studied, particularly with regard to their suitability for use in the furniture industry. The results of this study, by B. S. Gidvani and R. Bhattacharya, are contained in Technical Paper No. 19 of the London Shellac Research Bureau, India House, Aldwych, W.C.2. The viscosities, the non-volatile content of the lacquers, and the drying or hardening of the films suggest that suitable combination lacquers containing a fairly large proportion of lac can be made and it is not necessary to include comparatively large amounts of cellulose nitrate. In fact it is not necessary to have more than 15 per cent. cellulose nitrate of the shellac content in the lacquer. A fairly thick cut of lac solution, approximately 50 per cent., which would give films of approximately 50 microns in thickness is very slow drying compared with combination lacquer films of the same thickness. In the presence of lac, alcohol-soluble cellulose nitrate gives lacquers which dry faster than lacquers made with ester-soluble cellulose nitrate.

## Damaged Business Premises

### Board of Trade Leaflet to Assist Repair

TO assist owners of factories or other business premises, the Board of Trade has issued a leaflet bringing together all the necessary information about steps to be taken to obtain materials to repair or licences to rebuild premises and plant damaged by enemy action.

In view of the need for the greatest possible economy in the use of materials and labour, the leaflet tells owners that they can expect to be allowed to carry out only "first aid" repairs unless they are engaged upon essential work.

Copies of the leaflet may be obtained through local authorities or direct from the Regional Licensing Officers of the Ministry of Works and Buildings or from the Regional Officers of the Ministry of Health.

## General News

THE EMPLOYEES OF John and James White, Ltd., chemical manufacturers, of Rutherglen, have contributed £383 to charitable institutions during the past year.

MR. SYDNEY J. JOHNSTONE'S Streatfield Memorial Lecture on "The Empire's Mineral Armoury," is in preparation for issue this month by the Institute of Chemistry.

BY THE CONTROL OF TINS AND CANS (No. 3) Order, 1940, the prohibition against the use of tinplate containers for liquid soap (see THE CHEMICAL AGE, 43, 1101, p. 56) is now removed.

THE MINISTER OF AGRICULTURE has sent a message to farmers urging them to apply at least 1 cwt. per acre of sulphate of ammonia to all cereal crops this spring unless the land is in exceptionally good condition.

AFTER A RECORD SEASON, in which a thousand tons of sugar a day have been produced in the county alone, Lincolnshire sugar factories ceased production last Saturday. The amount of sugar extracted from the roots has scarcely ever been higher.

IN AN ARTICLE published by the *Newcastle Journal*, Mr. H. Robertson Holmes, of the British Association of Chemical Manufacturers, estimates that the total cost to the Germans of making "a hole in the road" in this country (that is, by dropping a percussion mine), is about £300, whereas the cost of repairing the damage is not more than about £60.

THE COMMISSIONERS OF CUSTOMS AND EXCISE have made new Regulations, the Purchase Tax (No. 2) Regulations, 1940, under Part V of the Finance (No. 2) Act, 1940. These Regulations have been published as S.R. & O. 1940 No. 2194 (price 2d.) and supersede The Purchase Tax Regulations 1940 (S.R. & O. 1940 No. 1552), dated August 23, 1940.

"THE CONCEPTION of a 'chemical' as a dangerous drug is gradually dying out as the essential chemical character of many of the processes of life is becoming accepted." This, chosen at random, is one of the many terse and suggestive phrases contained in a review of the Chemical Industry in the War, by A. J. Quig, a director of I.C.I., Ltd., in the *Trade Review* of the *Yorkshire Post* and *Leeds Mercury*, one of last Tuesday's most interesting publications.

DR. C. S. MYERS has contributed to the January number of *Occupational Psychology*, the journal of the N.I.L.P., a discussion of the conditions of work and the requirements of both routine and specialised scientific workers in industry. This should be of interest both to industrialists and industrial scientific workers, for Dr. Myers considers some of the temperamental and other qualities called for, incentives, opportunities for promotion, and improvements that might be made in selection and training.

OWING TO THE DEARER MARKET for raw materials, Messrs. May and Baker, Ltd., advise an increase in the price of sodium tartrate and potassium B.P. (Rochelle Salt), seidlitz powder B.P. and double seidlitz B.P.C., as follows: Rochelle salt, £11 10s. (over 5 cwt.) to £12 5s. (under 1 cwt.) per cwt.; seidlitz powder, £8 17s. to £9 8s. per cwt.; double seidlitz, £9 19s. to £10 12s. per cwt. Rochelle salt crystals, 2s. 6d. per cwt. extra; cases and casks extra; limited quantities only available. Special prices for quantity.

## Foreign News

THE EXPORT FROM ROMANIA of oil cake and other oil products has been prohibited, according to a Reuter report from Vichy.

NINE MILLION TABLETS containing vitamins A, B, C and D, devised by a panel of New York physicians, are being sent this year to England by the British-American Ambulance Corps. The first shipment of 300,000 tablets has already been despatched. According to a *Times* report the quantity will be sufficient for 4000 children to take six tablets each daily.

WORK HAS STARTED in Spain on a plant for manufacturing artificial wool, cotton and silk. Spain's large number of eucalyptus trees will provide the raw materials, and some 90 million pesetas have already been subscribed to the new company. It is understood that 25 per cent. of the capital comes from Italy and that other shares have been taken up by the banks, particularly those of Barcelona, which are closely connected with the textile industries. The new factory is at Torrelavega and will be ready for work in about two years.

## From Week to Week

WAREHOUSES CONTAINING WOLFRAM, RESIN, and petrol, as well as other storehouses and the port offices were destroyed by the flames in an extensive fire this week at Leixoes, the open-sea port of Oporto, Portugal.

THE SOVIET UNION, which has previously imported little copper from the United States, was its third best customer in 1940, according to a survey by the U.S.A. Bureau of Mines. During the year Russia took 108,955,900 lb. of copper. No indication is given as to how much of this might have been transhipped to Germany.

SOAP, ADJUSTED IN ITS CONTENT to meet the requirements of use in waters of different "hardness," is now being made in the United States by the Zoned Soap Company of Fort Wayne, Ind. The soap has been designed to hold mineral solids in solution, and since calcium and magnesium alone are 95 per cent. responsible for water hardness, the chemical content of the soap is adjusted to counteract these two minerals and also to eliminate the formation of insoluble metallic soap by holding all mineral solids in suspension.

ACCORDING TO AMERICAN CONSULAR REPORTS from Germany, the Reich Chemical Board has amended its previous instructions with respect to consumption of phosphatic fertilisers, by raising the quota for the Old Reich from 25 per cent. to 40 per cent. of the 1938-39 sales. In the case of Austria and the Sudetenland, consumers can take up to 48 per cent. of their consumption in the fertiliser year ended April 30, 1939, instead of 40 per cent., as previously specified. The new regulation covers the year ending April 30, 1941.

## Forthcoming Events

AN ORDINARY MEETING of The Institution of Civil Engineers will be held on January 21, at 1.30 p.m., at the rooms of the Institution, Great George Street, Westminster, S.W.1. A paper on "The Design of Sewage-Purification Works," by Mr. Herbert Cecil Whitehead, Member of Council, will be discussed. Light refreshments will be served at 12.45 p.m.

ON JANUARY 28 a special afternoon lecture for members of the Royal Institution of Great Britain and their friends will be delivered at the Royal Institution, 21 Albemarle Street, London, W.1, at 2.30 p.m., by Sir William Bragg, Fullerian Professor of Chemistry, whose subject will be "Diffraction."

A JOINT MEETING of the Plastics Group, Society of Chemical Industry, with the Chemical Society will be held at Burlington House, Piccadilly, W.1, on February 6, at 1.45 p.m., when Mr. F. W. Clark, B.Sc., F.I.C., will read a paper on "Plasticisers."

A JOINT MEETING of the Food Group and the Manchester Section of the Society of Chemical Industry will be held on February 7 at 1.30 p.m. in the Reynolds Hall, College of Technology, Manchester, when Mr. W. A. Richardson will present a paper on "The Swelling Behaviour of Starches."

ANOTHER SPECIAL AFTERNOON LECTURE for members of the Royal Institution of Great Britain and their friends will be given on "Explosives" by Dr. G. I. Finch, Professor of Allied Physical Chemistry, Imperial College, London, at the Royal Institution, 21 Albemarle Street, London, W.1, on February 11, at 2.30 p.m.

THE ANNUAL DINNER of the North of England Institute of Mining and Mechanical Engineers will be held in the Banqueting Room of the Royal Station Hotel, Neville Street, Newcastle-upon-Tyne, on February 14, at 7 for 7.30 p.m.

## IDENTIFICATION OF QUADRIVALENT TIN

A new and highly sensitive colour reagent for quadrivalent tin is anthraquinone-1-azo-4-dimethyl aniline hydrochloride which forms a blue-violet complex with stannic compounds. It is conveniently used in the form of test papers and the colour change is able to reveal the presence of quadrivalent tin down to quantities of the order of one-hundred millionth of a gram. (V. I. Kuznecov, *J. App. Chem.*, U.S.S.R., 1940, 5, 775).

# Weekly Prices of British Chemical Products

**T**HERE is little change of importance to record in the market for industrial chemicals and the tone throughout remains steady. While a good inquiry both for home and export is in circulation the volume of trade actually put through is largely covered by the supply position. Quotations for formic acid were advanced as from January 1, the new rate for the 85 per cent. being £47 per ton. Elsewhere arsenic, lead nitrate, oxalic acid and prussiate of soda are firm items. A steady flow of business is reported in coal tar products and there is a good export inquiry in spite of delays in shipment. Solvent naphtha is firm and all other items are steady.

**MANCHESTER.**—Taking the Manchester chemical market as a whole a moderate amount of new business has been reported during the past week both on home consumption and export accounts, whilst the movement into consumption against contracts, especially to the textile and allied trades, has been on a satisfactory scale. Prices generally are well held, with a strong undertone apparent in a number of directions. With regard to the by-products quotations show little change on balance, with a good demand and

marked firmness reported in the majority of the light materials, and also in creosote oil, whilst the naphthalenes are selling in fair quantities.

**GLASGOW.**—Business in general chemicals has been rather quiet during the week, both for home trade and export. Prices generally continue very firm, and where altered, prices for January delivery are dearer than they were for delivery in 1940, the average increase being approximately  $7\frac{1}{2}$  per cent. to 10 per cent.

## Price Changes

**Rises:** Naphtha, Solvent.

**Falls:** Cresylic Acid; Pyridine.

## General Chemicals

**Acetic Acid.**—Maximum prices per ton: 80% technical, 1 ton £36 10s.; 10 cwt./1 ton, £37 10s.; 4/10 cwt., £38 10s.; 80% pure, 1 ton, £38 10s.; 10 cwt./1 ton, £39 10s.; 4/10 cwt., £40 10s.; commercial glacial, 1 ton, £46; 10 cwt./1 ton, £47; 4/10 cwt., £48; delivered buyers' premises in returnable barrels. £4 per ton extra if packed and delivered in glass.

**Acetone.**—Maximum prices per ton, 50 tons and over, £52 10s.; 10/50 tons, £53; 5/10 tons, £53 10s.; 1/5 tons, £54; single drums, £55, delivered buyers' premises in returnable drums or other containers having a capacity of not less than 45 gallons each; delivered in containers of less than 45 gallons but not less than 10 gallons £10 10s. per ton in excess of maximum prices; delivered in containers less than 10 gallons each £10 10s. per ton in excess of maximum prices, plus a reasonable allowance.

**Alum.**—Loose lump, £9 10s. per ton, d/d, nominal.

**Aluminium Sulphate.**—£8 to £8 10s. per ton d/d.

**Ammonia Anhydrous.**—99/95%, 1s. 7d. to 2s. 2d. per lb., according to quantity and type of cylinders which are returnable; carriage paid; less for important contracts.

**Ammonium Carbonate.**—£39 to £40 per ton d/d in 5 cwt. casks.

**Ammonium Chloride.**—Grey galvanising, £22 10s. per ton, in casks, ex wharf. **MANCHESTER:** Grey galvanising, £19 to £20 per ton. See also Salammoniac.

**Antimony Oxide.**—£68 per ton.

**Arsenic.**—99/100%, about £31 10s. per ton, ex store.

**Barium Chloride.**—98/100%, prime white crystals, £11 10s. 0d. to £13 per ton, bag packing, ex works; imported material would be dearer.

**Bleaching Powder.**—Spot, 35/37%, £9 10s. to £10 per ton in casks, special terms for contract.

**Borax, Commercial.**—Granulated, £26; crystals, £27; powdered, £27 10s.; extra fine powder, £28 10s.; B.P. crystals, £35; powdered, £35 10s.; extra fine, £36 10s. per ton for ton lots, in free 1-cwt. bags, carriage paid in Great Britain. Borax Glass, lump, £73; powder, £74 per ton in tin-lined cases for home trade only, packages free, carriage paid.

**Boric Acid.**—Commercial, granulated, £42 10s.; crystals, £43 10s.; powdered, £44 10s.; extra fine powder, £46 10s.; large flakes, £55; B.P. crystals, £51 10s.; powdered, £52 10s.; extra fine powdered, £54 10s. per ton for ton lots in free 1-cwt. bags, carriage paid in Great Britain.

**Calcium Bisulphite.**—£6 10s. to £7 10s. per ton f.o.r. London.

**Calcium Chloride.**—70/75% solid, £5 10s. per ton ex store.

**Charcoal Lump.**—£10 10s. to £14 per ton, ex wharf. Granulated, supplies scarce.

**Chlorine, Liquid.**—£19 15s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £3d. per lb. d/d station in single 70-lb. cylinders.

**Chrometan.**—Crystals, 4½d. per lb.; liquor, £19 10s. per ton d/d station in drums. **GLASGOW:** Crystals 4d. per lb. in original barrels.

**Chromic Acid.**—1s. 2d. per lb., less 2½%; d/d U.K. **GLASGOW:** 1s. 0½d. per lb. for 1 cwt. lots.

**Citric Acid.**—1s. 2d. per lb. **MANCHESTER:** 1s. 6d.

**Copper Sulphate.**—About £29 10s. per ton f.o.b. **MANCHESTER:** £28 10s., less 2%, in 5 cwt. casks f.o.b. Liverpool.

**Cream of Tartar.**—100%, £10 2s. per cwt., less 2½%, d/d in sellers' returnable casks.

**Formaldehyde.**—£21 15s. to £25 per ton d/d. **MANCHESTER:** 40%, £24 to £25 per ton in casks d/d; imported material dearer.

**Formic Acid.**—85%, £47 per ton for ton lots, carriage paid, carboys returnable; smaller parcels quoted up to 50s. per cwt., ex store.

**Glycerine.**—Chemically pure, double distilled, 1,260 s.g., in tins, £3 10s. to £4 10s. per cwt. according to quantity; in drums, £3 2s. 6d. to £3 16s. 0d. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

**Hexamine.**—Technical grade for commercial purposes, about 1s. 4d. per lb.; free-running crystals are quoted at 2s. 1d. to 2s. 3d. per lb.; carriage paid for bulk lots.

**Hydrochloric Acid.**—Spot, 6s. 1½d. to 8s. 7½d. carboy d/d according to purity, strength and locality.

**Iodine.**—Resublimed B.P., 9s. 2d. to 13s. per lb., according to quantity.

**Lactic Acid.**—Dark tech., 50% by vol., £31 per ton; 50% by weight, £38; 80% by weight, £67; pale tech., 50% by vol., £39 10s.; 50% by weight, £46, 80% by weight, £74. Not less than one ton lots ex works; barrels returnable, carriage paid.

**Lead Acetate.**—White, £46 10s. to £48 10s. ton lots. **MANCHESTER:** £46 to £48 per ton.

**Lead Nitrate.**—About £45 10s. per ton d/d in casks.

**Lead, Red.**—English, 5/10 cwt. £42; 10 cwt. to 1 ton, £41 15s.; 1/2 tons, £41 10s.; 2/5 tons, £41; 5/20 tons, £40 10s.; 20/100 tons, £40; over 100 tons, £39 10s. per ton, less 2½ per cent. carriage paid; non-setting red lead 10s. per ton dearer in each case. Continental material £1 per ton cheaper.

**Lead, White.**—Dry English, less than 5 tons, £53 10s.; 5/15 tons, £49 10s.; 15/25 tons, £49; 25/50 tons, £48 10s.; 50/200 tons, £48 per ton less 5 per cent. carriage paid; Continental material £1 per ton cheaper. Ground in oil, English, 1/5 cwt., £62; 5/10 cwt., £61; 10 cwt. to 1 ton, £60 10s.; 1/2 tons, £59; 2/5 tons, £58; 5/10 tons, £56; 10/15 tons, £55; 15/25 tons, £54 10s.; 25/50 tons, £54; 50/100 tons, £53 10s. per ton less 5 per cent., carriage paid. Continental material £2 per ton cheaper.

**Litharge.**—1 to 2 tons, £41 10s. per ton.

**Lithium Carbonate.**—7s. 9d. per lb. net.

**Magnesite.**—Calcined, in bags, ex works, £14 to £17 per ton

**Magnesium Chloride.**—Solid (ex wharf), £12 to £13 per ton. **MANCHESTER:** £13 to £14 per ton.

**Magnesium Sulphate.**—Commercial, £10 to £12 per ton, according to quality, ex works.

**Mercury Products.**—Controlled price for 1 cwt. quantities: Bichloride powder, 12s. 3d.; bichloride lump, 12s. 10d.; ammon. chloride powder, 14s. 2d.; ammon. chloride lump, 14s.; mercurous chloride, 14s. 7d.; mercury oxide, red cryst., B.P., 16s. 4d.; red levig. B.P., 15s. 10d.; yellow levig. B.P. 15s. 9d.

**Methylated Spirit.**—Industrial 66 O.P. 100 gals., 2s. 0½d. per gal.; pyridinised 64 O.P. 100 gals., 2s. 1½d. per gal.

**Nitric Acid.**—£21 10s. to £29 10s. per ton ex works.

**Oxalic Acid.**—From £60 per ton for ton lots, carriage paid, in 5-cwt. casks; smaller parcels would be dearer; deliveries slow.

**Paraffin Wax.**—Nominal.

**Potash, Caustic.**—Solid, 88/92%, commercial grade, £53 7s. 6d. per ton, c.i.f. U.K. port, duty paid.

**Potassium Bichromate.**—Crystals and granular 7d. per lb.; ground 7d. per lb., carriage paid. **MANCHESTER** and **GLASGOW:** 7d. per lb. in orig. casks.

**Potassium Carbonate.**—Hydrated, 83/85%, £46 17s. 6d. per ton; calcined, 98/100%, £52 2s. 6d. per ton, c.i.f. U.K. port.

**Potassium Chlorate.**—Imported powder and crystals, ex store London, 10d. to 1s. per lb.

**Potassium Iodide.**—B.P., 8s. to 11s. 2d. per lb., according to quantity.

**Potassium Nitrate.**—Small granular crystals, £26 to £30 per ton ex store, according to quantity.

**Potassium Permanganate.**—B.P., 1s. 5½d. per lb. for 1 cwt. lots; commercial, £7 9s. 6d. to £8 1s. 6d. per cwt., according to quantity d/d.

**Potassium Prussiate.**—Yellow, about 1s. 3d. to 1s. 5d. per lb., supplies scarce.

**salammoniac.**—Dog-tooth crystals, £50 per ton; medium, £48 10s. per ton; fine white crystals, £19 10s. per ton, in casks, ex store.

**Soda, Caustic.**—Solid, 76/77% spot, £14 10s. per ton d/d station.

**Soda Crystals.**—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

**Sodium Acetate.**—£37 to £40 per ton, ex wharf.

**Sodium Bicarbonate.**—About £10 10s. to £11 10s. per ton, in bags.

**Sodium Bichromate.**—Crystals, cake and powder, 5½d. per lb., anhydrous, 6d. per lb. net d/d U.K. MANCHESTER and GLASGOW; 5½d. per lb., in orig. casks.

**Sodium Bisulphite Powder.**—60/62%, £16 per ton d/d in 2-ton lots for home trade.

**Sodium Carbonate Monohydrate.**—£20 per ton d/d in minimum ton lots in 2 cwt. bags.

**Sodium Chlorate.**—£36 to £45 per ton, d/d, according to quantity.

**Sodium Hyposulphite.**—Pea crystals, £19 15s. per ton for 2-ton lots; commercial, £14 10s. per ton. MANCHESTER: Commercial, £14 10s.; photographic, £19 15s.

**Sodium Iodide.**—B.P., for not less than 28 lb., 8s. 10d. per lb.; for not less than 7 lb., 10s. 9d. per lb.

**Sodium Metasilicate.**—£14 5s. per ton, d/d U.K. in cwt. bags.

**Sodium Nitrate.**—Refined, £10 to £11 per ton for 6-ton lots d/d.

**Sodium Nitrite.**—£22 to £23 per ton for ton lots.

**Sodium Perborate.**—10%, £4 12s. 6d. per cwt. d/d in 1-cwt. drums.

**Sodium Phosphate.**—Di-sodium, £19-£22 per ton, delivered, for ton lots. Tri-sodium, £25-£27 per ton d/d for ton lots.

**Sodium Prussiate.**—From 7d. per lb. ex store.

**Sodium Silicate.**—£9 15s. per ton, for 4-ton lots.

**Sodium Sulphate (Glauber Salts).**—£4 10s. per ton d/d.

**Sodium Sulphate (Salt Cake).**—Unground. Spot £4 5s. per ton d/d station in bulk. MANCHESTER: about £4 5s. ex works.

**Sodium Sulphide.**—Solid 60/62%, Spot, £15 5s. per ton d/d in drums: crystals, 30/32%, £10 12s. 6d. per ton d/d in casks. MANCHESTER: 60/62%, £15 12s. 6d.; 30/32%, £10 10s. per ton in 2-ton lots.

**Sodium Sulphite.**—Anhydrous, £29 10s. per ton; Pea crystals, spot, £16 10s. per ton d/d station in kegs; commercial, £11 15s. per ton d/d station in bags.

**Sulphur.**—Finely powdered, 17s. 6d. per cwt. d/d; precip. B.P., 68s. per cwt.

**Sulphuric Acid.**—168° Tw., £6 2s. 3d. to £6 13s. 3d. per ton; 140° Tw., arsenic-free, £4 7s. 6d. to £4 17s. 6d. per ton; 140° Tw., arsenious, £4 per ton; quotations naked at sellers' works.

**Tartaric Acid.**—2s. 6½d. per lb., less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 2s. 6½d. per lb.

**Zinc Oxide.**—Maximum prices: White seal, £30 17s. 6d. per ton; red seal, £28 7s. 6d. d/d; green seal, £29 17s. 6d. d/d buyers' premises.

**Zinc Sulphate.**—Tech., about £25, carriage paid, casks free.

### Rubber Chemicals

**Antimony Sulphide.**—Golden, 9½d. to 1s. 8d. per lb. Crimson, 1s. 8d. to 2s. per lb.

**Arsenic Sulphide.**—Yellow, 1s. 9d. per lb.

**Barytes.**—Best white bleached, £7 3s. 6d. per ton.

**Cadmium Sulphide.**—5s. 6d. to 6s. per lb.

**Carbon Black.**—5d. to 9½d. per lb., according to packing.

**Carbon Bisulphide.**—£32 5s. to £37 5s. per ton, according to quantity, in free returnable drums.

**Carbon Tetrachloride.**—£46 to £49 per ton.

**Chromium Oxide.**—Green, 1s. 6d. per lb.

**India-rubber Substitutes.**—White, 5½d. to 8d. per lb.; dark 5 3/16d. to 6d. per lb.

**Lithopone.**—30%, £25 per ton; 60%, £31 to £32 per ton. Imported material would be dearer.

**Mineral Black.**—£10 to £14 per ton.

**Mineral Rubber, "Rupron."**—£20 per ton.

**Sulphur Chloride.**—7d. per lb.

**Vegetable Lamp Black.**—42s. per cwt., d/d.

**Vermilion.**—Pale or deep, 14s. 6d. per lb., for 7 lb. lots and less. Plus 5% War Charge.

### Nitrogen Fertilisers

**Ammonium Phosphate Fertilisers.**—Type A, £21 8s.; B, £15 5s. 6d.; C, £18 17s. per ton in 6-ton lots, d/d farmer's nearest station up to June 30, 1941. Rebate of 1s. 6d. per ton per month for deliveries made prior to March 1, 1941.

**Ammonium Sulphate.**—Per ton in 6-ton lots, d/d farmer's nearest station: January, £9 19s.; February, £10 0s. 6d.; March/June, £10 2s.

**Calcium Cyanamide.**—Nominal; supplies very scanty.

**Concentrated Complete Fertilisers.**—£15 10s. to £16 3s. 6d. per ton in 6-ton lots, d/d farmer's nearest station up to June 30, 1941. Supplies small except C.C.F. Special at £15 14s. per ton.

**"Nitro-Chalk."**—£9 14s. per ton in 6-ton lots, d/d farmer's nearest station up to June 30, 1941.

**Sodium Nitrate.**—Chilean, £13 10s. per ton in 2-ton lots, f.o.r. Liverpool, January delivery; agricultural, £10 14s. per ton in 2-cwt. bags, d/d farmer's nearest station up to June 30, 1941.

### Coal Tar Products

**Benzol.**—Industrial (containing less than 2% of toluol), 2s. to 2s. 2d. per gal., ex works.

**Carbolic Acid.**—Crystals, 9½d. to 10½d. per lb.; Crude, 60's 3s. 6d. to 4s. 2d., according to specification. MANCHESTER: Crystals, 10½d. per lb., d/d; crude, 3s. 6d. to 3s. 9d. naked at works.

**Creosote.**—Home trade, 4½d. to 5d. per gal., f.o.r., makers' works; exports 6d. to 6½d. per gal., according to grade. MANCHESTER: 5d. to 7d. per gal.

**Cresylic Acid.**—Pale, 99/100%, 2s. 2d. per gal. MANCHESTER: Pale, 99/100%, 2s. 2d. per gal.

**Naphtha.**—Solvent, 90/160°, 2s. 1d. to 2s. 4d. per gal.; Heavy 90/190°, 1s. 7d. naked at works. MANCHESTER: 90/160°, 2s. 1d. to 2s. 3d.

**Naphthalene.**—Crude, whizzed or hot pressed, £14 per ton; purified crystals, £27 per ton in 2-cwt. bags; flaked, £27 per ton. Fire-lighter quality, £6 to £7 per ton ex works. MANCHESTER: Refined, £26 per ton.

**Pitch.**—Medium, soft, 50s. per ton (nominal) f.o.b. MANCHESTER: Nominal.

**Pyridine.**—90/140°, 16s. 6d. per gal.; 90/160°, 13s. 6d.; 90/180°, 4s. to 5s. per gal., f.o.b. MANCHESTER: 14s. to 17s. per gal.

**Toluol.**—Pure, 2s. 5d., nominal. MANCHESTER: Pure, 2s. 5d. per gal., naked.

**Xylol.**—Commercial, 3s. 3d. per gal.; pure, 3s. 6d. MANCHESTER: 3s. to 3s. 4d. per gal.

### Wood Distillation Products

**Calcium Acetate.**—Brown, £21 per ton; grey, £24. MANCHESTER: Grey, £21.

**Methyl Acetone.**—40.50%, £42-£45 per ton.

**Wood Creosote.**—Unrefined, 2s. per gal., according to boiling range.

**Wood Naphtha, Miscible.**—4s. 6d. to 5s. per gal.; solvent, 5s. per gal.

**Wood Tar.**—£5 to £6 per ton, according to quality.

### Intermediates and Dyes (Prices Nominal)

**m-Cresol 98/100%.**—1s. 8d. to 1s. 9d. per lb. in ton lots.

**o-Cresol 30/31° C.**—8d. to 9d. per lb. in ton lots.

**p-Cresol 34/35° C.**—1s. 8d. to 1s. 9d. per lb. in ton lots.

**Dichloraniline.**—2s. 8½d. per lb.

**Dinitrobenzene.**—8d. per lb.

**Dinitrotoluene.**—48/50° C., 9½d. per lb.; 66/68° C., 1s.

**p-Nitraniline.**—2s. 5d. per lb.

**Nitrobenzene.**—Spot, 5½d. per lb., in 90-gal. drums, drums extra, 1-ton lots d/d buyer's works.

**Nitronaphthalene.**—1s. 2d. per lb.; P.G., 1s. 0½d. per lb.

**o-Toluidine.**—1s. per lb., in 8/10 cwt. drums, drums extra.

**p-Toluidine.**—2s. 2d. per lb., in casks.

**m-Xyldine Acetate.**—4s. 5d. per lb., 100%.

### Latest Oil Prices

LONDON.—January 15.—For the period ending February 1 per ton, net, naked, ex mill, works or refinery, and subject to additional charges according to package and location of supplies:—  
LINSEED OIL, raw, £41 10s. RAPESEED OIL, crude, £44. COTTON-SEED OIL, crude, £31 2s. 6d.; washed, £34 5s.; refined edible, £35 12s. 6d.; refined deodorised, £36 10s. SOYA BEAN OIL, crude, £33; refined deodorised, £37. COCONUT OIL, crude, £28 2s. 6d.; refined deodorised, £31 7s. 6d. PALM KERNEL OIL, crude, £27 10s.; refined deodorised, £30 15s. PALM OIL, refined deodorised, £37; refined hardened deodorised, £41. GROUNDNUT OIL, crude, £35 10s.; refined deodorised, £40. WHALE OIL, crude hardened, 42 deg., £30 10s.; refined hardened, 42 deg., £33. ACID OILS.—Groundnut, £19; soya, £17; coconut and palm kernel, £22 10s. ROSIN, 25s. to 30s. per cwt., ex wharf., according to grade. TURPENTINE, nominal (Glasgow), 68s. per cwt. spot, American, including tax, ex wharf, in barrels, and ex discount).

HULL.—January 14.—TURPENTINE, spot, American, nominal.

## Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

### Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an \*—followed by the date of the Summary, but such total may have been reduced.)

**NELEX PRODUCTS, LTD.**, London, W., manufacturers of raw plastic material. (M., 18/1/41.) December 27, £625 deb., part of a series already registered.

**NORBRIT ALLOYS, LTD.**, Newcastle-upon-Tyne. (M., 18/1/41.) December 26, deb., to Barclays Bank, Ltd., securing all moneys due or to become due to the Bank; general charge. \*Nil. September 12, 1940.

**METAL TREATMENT, LTD.**, Kingston-upon-Thames. (M., 18/1/41.) December 16, £2,636 1s. 6d. deb., to Celestion, Ltd.; general charge.

### Companies Winding-Up

**PLASTICS BY FAIRFAX, LTD.**, Hyde Junction Works, Dukinfield, Cheshire. (C.W.U., 18/1/41.) Arthur Tyldesley Eaves, of 47 Mosley Street, Manchester, 2, appointed liquidator.

## Company News

**Berry Wiggins and Co., Ltd.**, bituminous compound manufacturers, have declared a dividend of 5 per cent. on A ordinary shares.

**Universal Asbestos Manufacturing Co., Ltd.**, have declared a dividend of 30 per cent. on ordinary shares (no change).

**Ley's Foundries and Engineering, Ltd.**, recommend a final dividend of 5 per cent., less tax, making a total dividend of 11 per cent., less tax, for the year (same).

The directors of the **Royal Dutch Petroleum Co., Ltd.**, have announced that they do not feel justified, in present circumstances, in paying an interim dividend for 1940.

The directors of the **Electrolytic Zinc Co. of Australasia** have declared a dividend of 6 per cent. on both preference and ordinary shares for the six months to December 31 (last year the same).

The **Gas Light and Coke Company** announces that the declaration of a dividend for the six months to December 31, 1940, on the 3½ per cent. and 4 per cent. preference shares has been postponed pending the completion of the accounts.

## New Companies Registered

**Imber Research, Ltd.** (364,558).—Private company. Capital £1000 in 1000 shares of £1 each. To acquire and test any patents, rights and concessions, to erect and equip laboratories for research work, and to conduct investigations or experiments, either alone or with others. Directors: Jack Imber, chairman; Evelyn May Imber, Alfred G. Imber, Edith I. Allen, Margaret J. Thurgood, secretary. Solicitors: Beaumont, Son and Rigden, 18 Fleet Street, E.C.4. Registered office: Aladdin Building, Western Avenue, Greenford, Middlesex.

**Foudrex, Ltd.** (21,618).—Private company registered in Edinburgh. Capital £100 in 100 shares of £1 each. Manufacturers, exporters, importers and wholesale and retail merchants of and agents for insecticides, fungicides, vermifuges, sprays, dips, medicines, remedies and compounds, etc., for the protection of human beings, animals, plants, etc. Subscribers: Geoffrey M. Rhodes, Laigh Killockside, near Carnunnock; W. F. Finlayson.

## Chemical and Allied Stocks and Shares

**IMPROVEMENT** in telephone facilities in the City made for a better volume of business on the Stock Exchange, where, on balance, movements in security values were small but mostly in favour of holders. Sentiment has been assisted by hopes that this year the incidence of E.P.T. may be made less inequitable, while it is being suggested that the War Damage Insurance Bill may incorporate provisions for interim payments in respect of damage from air-raids. Markets generally have continued to be influenced by the trend in gilt-edged stocks, which as time pro-

ceeds are likely to be in much larger demand, bearing in mind that a good part of the proceeds arising from the requisitioning of American dollar securities is expected to be re-invested in British Funds.

Imperial Chemical ordinary units remained active, and were slightly higher at 30s. 3d., while there was increased demand for the 7 per cent. preference units, which, as compared with a week ago, rose further from 33s. 3d. to 34s. B. Laporte were inactive but continued around 52s. 6d., while Eison Packard changed hands at slightly over 30s., and Cooper McDougall & Robertson were again quoted at 20s. The 7 per cent. preference shares of the last-named company changed hands and were 24s. 4½d. Exceptionally, the securities of London gas companies were reactionary on the decision of The Gas Light & Coke Co. to postpone dividends for the past half-year on the 3½ per cent. redeemable preference stock, and the 4 per cent. consolidated preference stock, pending completion of accounts for 1940. This is attributed in the market to the effect on the income of gas companies of evacuation, air-raid damage, and other factors arising from the war.

Turner and Newall ordinary units rose from 65s. 7½d. to 68s. 1½d. and remained in good demand on further consideration of the annual results; the higher net profits were arrived at after providing as much as £929,966 for taxation, compared with £618,826 in the previous year. Borax Consolidated deferred units were better, having improved on the week from 25s. 7½d. to 26s. 3d., while elsewhere Nairn & Greenwich have risen from 48s. 9d. to 50s. on the dividend, which was in excess of most market estimates. Barry & Staines improved from 23s. 9d. to 24s. 6d. British Aluminium, too, were firmer at the slightly better price of 42s., and British Oxygen moved up from 63s. 9d. a week ago to 66s. 3d. United Molasses held their recent improvement to 24s., while the units of the Distillers Co. were slightly higher at 66s. Pinchin Johnson kept their recent rally to 19s. 6d., and business in Indestructible Paint took place up to 77s. 6d. British Match, however, remained at 30s. 9d.

Dunlop Rubber attracted attention and moved up to 33s. 7½d., while Metal Box were higher at 70s. Associated Cement were 58s. 9d., and other cement shares were firm, though unchanged on balance. British Plaster Board were active, and these 5s. shares were quoted around 13s. Babcock and Wilcox made the improved price of 40s., while Tube Investments were 90s. 7½d., and Stewarts and Lloyds changed hands up to 42s. 6d., but, on the whole, securities included in the iron and steel group attracted less attention than last week.

Among smaller priced shares, British Tar Products 5s. ordinary showed business around 5s. 6d. Morgan Crucible 5 per cent. preference transferred at 18s. 9d., and Canning Town Glass changed hands at 5s. 3d. Forster's Glass were done at 10s. 7½d. and the preference shares at 20s. Elsewhere, Boots Drug were around 38s. and Timothy Whites 19s. 9d. Southalls (Birmingham) 5s. shares changed hands at 24s.; the financial results of this progressive company are due next month. Movements in "Shell" and other leading oil shares were to improved levels.

## Soap Substitutes in Germany

### High Kaolin Content

**EXHIBITS** of soap and soap substitutes at the 1940 Leipzig Sample Fair were unimpressive, states an American observer, writing in *Foreign Commerce Weekly*. Although exhibition stands of soap manufacturers were attractive, exhibits consisted mainly of the so-called "Einheitsseife" a soap substitute manufactured according to war regulations. It contains not more than 40 per cent. of fat or grease, the rest being chiefly kaolin. Such soap serves its purpose, but is neither pretentious nor attractive in appearance or size. By governmental regulations such pieces of "Einheitsseife" are manufactured in uniform size and shape, and not ornamented except for the embossed letters R.I.F. There is also a number identifying the manufacturer of the particular cake. It is either impracticable or forbidden to put such soaps into attractive cardboard boxes formerly popular in Germany.

Although, theoretically, German manufacturers are allowed to manufacture soap of the same quality as before the war for export, manufacturers stated they actually do little export business on account of insufficient orders which make the manufacture unremunerative, and because of difficulties over governmental permits and the supply of raw materials.

The December, 1940, issue of "Alloy Metals Review," published by HIGH SPEED STEEL ALLOYS, LTD., Widnes, is devoted to abstracts from chemical and metallurgical journals.

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